8 feet of the bottom of the tanks, for drawing off, as the more solid particles precipitate, the watery portion of the sewage, into (D) a properly constructed filter, in which the water is purified, and passed by means of the drains (E) and pipes (F into the wells and reservoirs, 6, 7, 9, 10, and hence, as desired, into No. 8. H represents a tower higher than the highest house in the sewerage district, with supply reservoir at its top, and chimney through the same; I, engine-house, &c.; L, ledges around sewage-tanks, 1, 2, 4, 5, and filters D, four feet wide; M, 6 feet spaces of boards resting on ledges, leaving alternate intervals of 4 feet; N, boxes placed in these intervals, with hinged bottoms, and levers attached; O, finely-sifted coal-ash, placed on the boards, and within the boxes; P, boards over M; Q, covers to the boxes; R, safety-sluice in main sewer for diverting the sewage into tanks when closed, or passing the storm-waters clear of them when open by communication with a river.

Having thus enumerated the requirements necessary for converting by this system sewage matter into dried manure and clear water, let us now describe the process by which this result is to be effected.

The boxes and intervals between the same over tank No. 1 and the adjoining filter being filled with coal-ash to the depth experiment has determined as sufficient for effectually preventing the escape of effluvia, the sewage matter is admitted into tank No. 1, and on that being full, into No. 2, and so on throughout the series. Here it is allowed to remain for precipitation, the watery portion of the sewage, during the deposition of the more solid, being drawn off into the filter by means of the cocks set in finely-pierced metal, as before described. These cocks would be worked in stages, and their ceasing to run would intimate that the matter had become sufficiently consistent for the introduction of the coal-ash through the boxes, gradually, but in sufficient quantities to deodorize the sewage without destroying its properties as a manure, care being taken continually to replenish the boxes so as to retain sufficient thickness of coal-ash to prevent the escape of effluvia. The sewage being now sufficiently solidified, heat would be applied to the matter in the tank, by means of flues, pipes, or other effectual and approved method, for the purpose of evaporating the remaining moisture, which would be absorbed by the coal-ash over the boards: gypsum may now be introduced through the boxes for further deodorizing and fixing the volatile gases of the manure; and the drying process being complete, the tank may now be ventilated and lighted, and men, entering the tank through the boxes, may fill the contents into bags, which being removed by the hydraulic cranes, may be stored for sale in a convenient part of the premises.

The coal-ash between the boards, which has absorbed the moisture emitted during the drying process, may now be transferred to the bottom of the tank, and fresh substituted.

Coal-ash is named as the most desirable for this purpose, and from its being easily obtainable in towns; but sand, street sweepings, or the like, would be useful substitutes. It is presumed the manure thus obtained, would be of a most fertilising quality, and being solid, inodorous, and portable, would find a ready sale.

The water, having been received upon the filter, gravitates through whatever chemically and mechanically prepared strata the best experience on such matters may suggest, and is passed into reservoir or well No. 5, immediately below: thence it drains into No. 8, from which it is pumped into No. 3, in a perfectly purified state: it is then pumped into the supply tank at the top of the tower, for the purpose of distribution as the wants of the district may demand; and among the numerous uses to which it may be advantageously applied, may be named the working of hydraulic machinery, the supply of closets, manufactories, mews, watering streets, and the extinction of fires.

Among the advantages which this scheme possesses over the existing system of town drainage may be mentioned,—

1. As the main drains would be, comparatively to the existing ones, short, their size, and consequently the cost of their formation and repair, would be proportionably less.

2. Manual cleansing and flushing would be rendered unnecessary from the facilities the system would offer in obtaining a proper inclination for the main and tributary sewers.

3. From the opportunities afforded of mechanical and chemical action on the sewage matter—mechanical in the processes of deposition, filtration, &c. as before described, and chemical in the facility by which any preparation may be introduced into both the tanks and filter, through the boxes,—it is assumed that if it is possible, by mechanical and chemical agency, to render sewage water clear and inodorous, every possible means are afforded according to this scheme.

4. The abundance of clear inodorous water would render the system nearly self-acting and self-paying;—*self-acting*, on account of its affording so much facility for working machinery: it would not only work cranes for emptying out the tanks, which would reduce manual labour to a great extent, but by the application of hydraulic pressure to pumping machinery, it might be made to supply the water-tank at the top of the tower in any quantity required;—*self-paying*, for if short hydraulic-pressure machinery be necessary for the working of any manufactory in the neighbourhood it could be supplied; and it is supposed that the sale of the water for other purposes would pay amply for the staff and repairs which might be occasionally necessary at the places of collection; moreover, as the basement story and first story only would be required for carrying into effect the proposed scheme, a building could be erected over the first story suitable for a steam-mill, or any manufactory or warehouse, and so free would these places be from the escape of effluvia, from the depth of the coal-ash on the top of the tanks, &c. that the superstructure would be applicable even for model lodging-houses. The rent of these buildings would probably cover the rent of the land necessary for the places for receiving the sewage.

In order to complete the cleansing of towns, it will be necessary to remove, in the most effectual manner, and to manufacture into valuable manure, without the escape of effluvia, every description of animal refuse, including dead horses, dogs, &c. and every description of vegetable refuse. The removal of all this could be effected by covered vans, made air-tight, and conveyed to pits excavated in the sewage district for the purpose. The pits should be seven in number, and each pit should be large enough to contain one month's vegetable and animal refuse of the district. To render the system more intelligible, I will suppose each pit to be 100 feet by 40 feet, and 30 feet deep. Over the top of this pit an open railway should be constructed, upon which the covered vans could be driven, and their contents emptied out through their bottoms. The order in which this refuse should be placed in the pits is as follows:—1 foot thick of dry and sifted street sweepings should be placed at the bottom of the pit: over this 1 foot of stable dung should be spread, treading it down carefully: 6 inches of animal and vegetable refuse should be placed on this layer of stable dung: another layer of stable dung, 1 foot thick, should now be spread over the animal and vegetable refuse, treading it down carefully as before, and over this should be placed 6 inches of street sweepings, the surface of which should be spread evenly and rolled. Over this a layer of dung, 1 foot thick, should be placed, treading it down carefully as before; then a layer, 6 inches thick, of animal and vegetable refuse as before; then another layer of dung, 1 foot thick; and then 6 inches of street sweepings. Exactly the same process should be carried on as before until the pit is full, when it should be crowned with 18 inches of street sweepings. During the process of filling the pit care should be taken to finish the day's work with the layer of street sweepings, so as to prevent the possibility of the escape of effluvia. In six months, if this heap were opened, it would be found to be one homogeneous mass, resembling black butter: it would be impossible to distinguish the dung from the animal and vegetable matter; or the animal and vegetable matter from the street sweepings. It would be one uniform black colour, and as inodorous as the usual farm-yard dung, after it has been turned and exposed to the atmosphere. Indeed, from my own experience, I will venture to affirm that it would be, after lying six months in the pit, as inodorous as maiden-soil, and much more fertilizing and lasting in its effects than any description of farm-yard dung. The open railway over the top of the pits would much facilitate the emptying out; and if intervals were left between the pits, similar to the intervals described between the sewage tanks, cranes could be worked by hydraulic pressure, which would much facilitate the operation of emptying. It is to be observed, that as only the basement and ground story is necessary for carrying on these operations, buildings for any purpose might be erected over these pits.

Probably the steam-engine might be dispensed with by a judicious application of the water-power: at the points where the lower wells empty themselves into the deep well, a wheel might be placed which would work a pump, which might lift the water to the upper water-tank No. 3. The water in No. 3 might be let off upon hydraulic rams placed at the bottom of the tower, which would raise the water to the tank at the top of the tower. When the tank at the top of the tower over-flowed, it would be conducted into five water-tanks constructed on the top of the building which is proposed to be erected over the sewage-tanks. The roof of the building over the vegetable and animal refuse-pits might be turned to the same account, i. e. a reservoir for holding the filtered water. The water-tanks at the top of the buildings could be constructed of any depth, and each tank being separate any leakage could easily be repaired. The sewage-tanks might be heated by gas instead of steam. If the rams should not be sufficiently powerful, probably some self-acting plan could be struck out; for when the quantity of water is taken into account, and the power of applying it in any manner most convenient, it certainly does appear reasonable.

A. H. Gore.

SCIENCE AT THE SHERIFFS' INAUGURATION DINNER.

A good step was taken by the new sheriffs, Mr. Alderman Carter and Mr. Angus Croll, on the 30th September, at the London Tavern, but it did not go far enough. It would appear that they had invited the secretaries of various learned societies, and other scientific men, but they did not concern themselves to place these properly, and in some cases, indeed, provided them no place at all. Thus we saw the eminent secretary of the Royal Society—apparently the only officer of that body present, and therefore the actual representative there of pure science—chased from chair to chair, and ultimately transformed into a "vocalist" for the nonce, and squeezed into an extemporised seat in close proximity to the door, where the in-draught gave the candles the appearance of stalactites, and rendered a long stay impossible. Two other learned professors might very properly have been told to "go up higher." This error is the more singular, as both the sheriffs are connected in a degree with science: but unfortunately, in the City, precedent is so strong that men, when they get into office, seem forced to succumb to it, and are positively afraid to do better than their predecessors.

Mr. Bathe, with the suavity and tact that belong to him, and have enabled him to place his house the first in general estimation, tried to make all contented; but he could not talk away a crick in the neck or the pressure of an Arnott's stove at one's back.

Improvement in Anvils.—A patent has recently been taken out by Mr. P. Wright, of Dudley, for constructing the largest anvils of at most but two separate pieces, and smaller of only one, by means of two hollow dies of cast-iron, into which the mass of heated iron is forced till it assumes its shape.

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